

## **CEQA Appendix C**

### **Wetlands Comparison**

### **Eagle Lake Sewage Ponds Project**

The proposed project area boundary for the Eagle Lake Sewage Ponds project includes 0.89 acres of depressional Little Merrill Flat wetlands located near the southern part of the National Forest System (NFS) land property boundary, Map 2. The area where the depressional wetlands are presently located may have been altered by the 1993 modifications to the sewage ponds, as described in Modification of the Eagle Lake Treatment Plant, 1993. According to the 1993 project plans, the current location of the wetlands was the site of the 1993 borrow pit source. Studies by Foothill Associates 2009 have since delineated the Forest Service portion the Little Merrill Flat wetlands as jurisdictional depressional seasonal wetlands

The Little Merrill Flat wetlands are comprised of 117 acres (99.9 percent of which are located on private land) of saturated seasonal wetlands and 0.89 acres of depressional seasonal wetlands (located on National Forest System land), Map 2. The Little Merrill Flat wetlands are located near the head waters of Merrill Creek. Merrill Creek is an intermittent stream, seasonally flowing for at least 90 days a year, and draining to Eagle Lake. Snowmelt provides the majority of the surface runoff, which is dispersed. Surface water and possibly emergent groundwater may flow from the wetlands to Eagle Lake via Merrill Creek during snowmelt runoff events, rain-on-snow events, and potentially during rain events when soils are highly saturated. The existing Eagle Lake Sewage ponds are located adjacent to the wetlands. Current studies have shown the sewage ponds are hydrologically disconnected from the wetlands and hence, from Eagle Lake (Foothill Associates, 2009).

On a local scale, construction activities under Alternative 1 would pose a high risk to the depressional Little Merrill Flat wetlands. There would be a long-term disturbance and loss of 0.77 acres of 0.89 acres of jurisdictional depressional Little Merrill Flat wetlands located in the Merrill Creek watershed (Foothill Associates, 2009). This long-term loss of wetland would result from the expansion of Evaporation Pond 3 and the addition of 28,000 cubic yards of fill into and over the wetland. The remaining 117 acres of Little Merrill Flat wetlands would be saturated seasonal wetlands that would provide a different kind of habitat as compared to depressional wetlands.

Papoose Meadow is a large 270-acre meadow located about 4.5 miles east of the Little Merrill Flat wetlands, Map 1. Restoration of Papoose Meadow would be used to mitigate construction activities in Alternative 1. Currently only 160 acres of the 270 acres are a seasonally flooded wet meadow and marsh system (Sanger, 2007). The restoration project would aim to restore Papoose Meadows to its pre-settlement hydrologic and vegetative condition, which would be 270 acres of wet meadow and marsh. This could result in the increase of 110 acres of wet meadow and marsh. For additional details refer to the project application to the Lassen Modoc Special Status Plant Fund (Sanger, 2007) (CEQA Appendix D)

Water resources in Papoose Meadows support the same faunal species as the delineated Little Merrill Flat wetlands. Additionally the Papoose Meadow wetlands support snail and clam species adapted to both seasonal and perennial waters and western toads (*Bufo boreas*). Through restoration of the Papoose Meadows wetlands, the warm water portion of the wetland would be expanded by expanding the habitat available to these species. Springs associated with Papoose meadows supports two endemic hydrobiid snails and an endemic *Vorticifex spp.* Snail. The spring habitat is not expected to be affected by the Papoose Meadows restoration.

The following tables and discussion summarize the comparison of the two wetland areas in terms of beneficial uses, biological species present, and soils

**Table 1. Beneficial uses for Little Merrill Flat wetlands and Papoose Meadows Wetland Project.**

	Little Merrill Flat Wetlands		Papoose Meadows wetland	
	Potential	Current in project area	Potential	Additional creation
Municipal and Domestic Water Supply	x	No current use	x	No current use
Agricultural Supply	x	Supports vegetation for range grazing, limited stock watering	x	Past support for range grazing and stock watering/ now not managed for this use
Groundwater Recharge	x	yes	x	Yes – increases with project
Freshwater Replenishment	x	no	x	Yes – decreases with project
Recreation (Contact and Non-Contact with Water)	x	Non-contact recreation	x	Non-contact recreation
Cold Freshwater Habitat	x	Does not support – warm water habitat	x	Supports- also supports warm water habitat
Wildlife Habitat	x	Currently supports	x	supports
Preservation of Biological Habitats of Special Significance	x	Non known	x	Several endemic snail species known/ Largest known Modoc Plateau Playa – helps restore historical extent of wetland
Rare, Threatened, or Endangered Species	x	Does not support	x	Greater sandhill crane habitat would be enhanced
Migration of Aquatic Organisms	x	Does not support		Does not support but potential to support Eagle Lake rainbow trout
Spawning, Reproduction, and Development	x	Supports Pacific Tree frogs	x	Supports Pacific Tree frogs and snails
Water Quality Enhancement	x	yes	x	Yes – increases with project
Flood Peak Attenuation/Flood Water Storage	x	yes	x	Yes – increases with project

Source: Hydrology Report

**General Aquatics present:** Water resources in the project area support common aquatic species adapted to seasonal waters such as chironomids, damselfly larvae, mayfly larvae and Pacific tree frogs (*Pseudacris regilla*).

**Table 2 : Aquatics species analyzed for Little Merrill Flat and Papoose Meadow wetlands comparison**

Species/habitat	NFS Land delineated wetlands in project area	Papoose Meadows Wetlands after restoration
Great Basin rams-horn ( <i>Helisoma newberryi newberryi</i> )	Not present	Not present
montane peaclam ( <i>Pisidium ultramontanum</i> )	Not present	Not present
Eagle Lake rainbow trout ( <i>Oncorhynchus mykiss aquilarum</i> )	Not present	Not present
Wet meadow - Pacific tree frog ( <i>Pseudacris regilla</i> )	present	present

Source: Aquatics Report

Water resources in the proposed mitigation site support the same species as the delineated wetlands. Additionally these wetlands support snail and clam species adapted to both seasonal and perennial waters and western toads (*Bufo boreas*). The warm water portion of the wetland would be expanded, expanding the habitat available to these species. Springs associated with Papoose meadows supports two endemic hydrobiid snails and an endemic *Vorticifex spp.* snail. The spring habitat is not expected to be affected by meadow restoration.

**General terrestrial wildlife present:** Water resources in the proposed mitigation site support some of the same species as the delineated wetlands (pallid bat (*Antrozous pallidus*) and northern goshawk (*Accipiter gentilis*)). Additionally the proposed mitigation site wetlands support avian and mammalian species adapted to both seasonal and perennial waters (greater sandhill crane (*Grus canadensis tabida*), northern bald eagle (*Haliaeetus leucocephalus*), Townsend's big-eared bat (*Corynorhinus townsendii*), and the western Red Bat (*Lasiurus blossevillii*)).

**Table 3. Terrestrial species analyzed for project wetland comparison**

Species/habitat	NFS Land delineated wetlands in project area	Papoose Meadows Wetlands after restoration
Greater sandhill crane ( <i>Grus canadensis tabida</i> )	Not Present	Present
Pallid bat ( <i>Antrozous pallidus</i> )	Present	Present
Northern bald eagle ( <i>Haliaeetus leucocephalus</i> )	Not Present	Present
Northern goshawk ( <i>Accipiter gentilis</i> )	Present	Present
Townsend's big-eared bat ( <i>Corynorhinus townsendii</i> )	Not Present	Present
Western red bat ( <i>Lasiurus blossevillii</i> )	Not Present	Present

Source: Wildlife Biologist

**General plant life present:** Water resources in the proposed mitigation site support some of the same species as the delineated wetlands, particularly the rush *Juncus balticus* (referred to in some accounts as *Juncus mexicanus*) and spikerush (*Eleocharis* sp.) Both plants are characteristic of sites with some degree of seasonal saturation. In general, however, Papoose Meadows is a much larger system than Little Merrill Flat, with deeper, more extensive and more persistent inundation. Two Forest Service Special Interest species, sweet marsh ragwort (*Senecio hydrophiloides*) and lesser bladderwort (*Utricularia minor*), are found in a very wet part of Papoose Meadows, near the head of Papoose Creek. One Forest Service Special Interest species, Egg Lake monkeyflower (*Mimulus pygmaeus*), is found on relatively early-drying soil along the edges of the Eagle Lake sewage facility and probably elsewhere in the private portion of the wetlands at Little Merrill Flat. None of these species have any further protection status with the federal government or with the state of California.

Table 4. Plant species analyzed for project wetland comparison

Species/habitat	NFS Land delineated wetlands in project area	Papoose Meadows Wetlands after restoration
Egg Lake monkeyflower ( <i>Mimulus pygmaeus</i> )	Present	Not Present
Sweet marsh ragwort ( <i>Senecio hydrophiloides</i> )	Not Present	Present
Lesser bladderwort ( <i>Utricularia minor</i> )	Not Present	Present

Source: Forest Botanist

**Soils:** The soils of Little Merrill and Papoose Meadows are nearly identical with both areas having soils characterized by the Aquoll family. The surface horizon of Aquolls are characterized by loam and silt loam textures with granular and blocky structures. Underlying the surface layer are blocky and massive soil structures, often composed of a near-impermeable silt- or fragi-pans, resulting in very slow rates of water permeability and, consequently, extended periods of ponding on the soil surface. This diagnostic feature also results in restricted root growth to near-surface depths. Parent materials of these soils are quaternary volcanic rocks derived from flow basalts and andesites, making them high in base cations and exchangeable phosphorus





# Map 1: Vicinity Map of Eagle Lake, Little Merrill Flat wetlands, and Papoose Meadows.



